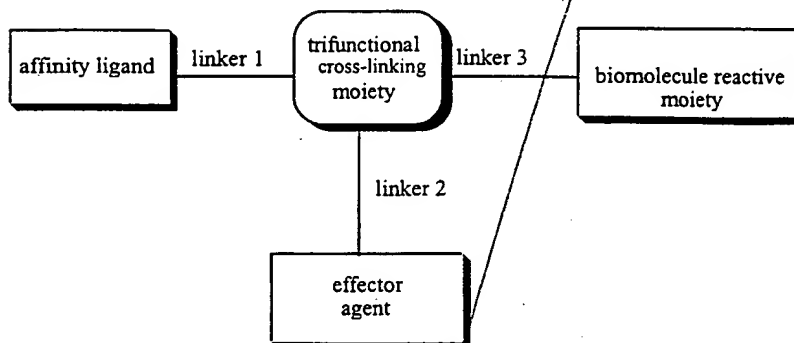


CLAIMS

1. Reagent for conjugation to a biomolecule, wherein
5 the reagent is a single molecule with at least three functional parts and has the following schematic structure (I):



10

a) wherein a trifunctional cross-linking moiety is coupled to

b) an affinity ligand via a linker 1, said affinity ligand being capable of binding with another
15 molecule having affinity for said ligand, to

c) an effector agent, optionally via a linker 2, said effector agent exerting its effect on cells, tissues and/or humorous molecules in vivo or ex vivo, and to

20 d) a biomolecule reactive moiety, optionally via a linker 3, said moiety being capable of forming a bond between the reagent and the biomolecule.

2. Reagent according to claim 1, wherein the trifunctional cross-linking moiety is chosen from the group
25 consisting of triaminobenzene, tricarboxybenzene, dicarboxyaniline and diaminobenzoic acid.

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Claims

claim!

claim

Claim 1

Claim

30 9. Reagent according to ~~claims 1-8~~ ^{claim 1}, wherein linker 1 contains hydrogen bonding atoms such as ethers or thioethers, or ionizable groups such as carboxylates, sulfon-

ates, or ammonium groups to aid in water solubilization of the biotin moiety.

a 10. Reagent according to ~~claims 1-9~~ ^{claim 1}, wherein stability towards enzymatic cleavage, preferably by biotinidase, of the biotinamide bond to release biotin have been improved by introducing an alpha carboxylate or an N-methyl group in linker 1.

11. Reagent according to claim 1, wherein the effector agent is chosen from the group consisting of synthetic or natural occurring toxins, enzymes, preferably enzymes capable of converting a pro-drug to an active drug, hormones, immunosuppressive agents, immunostimulating agents, radionuclide binding/bonding moieties, radiosensitizers, enhancers for X-ray or MRI or ultrasound, non-radioactive elements which can be converted to radioactive elements by means of external irradiation after that the biomolecule carrying said element has been accumulated to specific cells or tissues, or compounds used in photoimaging or photodynamic therapy.

12. Reagent according to ~~claims 1-11~~ ^{claim 1}, wherein the effector agent is a radionuclide binding/bonding moiety to which radionuclides can be bound by chelation or covalent bonding.

13. Reagent according to ~~claim 1~~ ^{claim 1}, wherein the effector agent is a radionuclide binding/bonding moiety to which radionuclides are bound by chelation or through covalent bonding

a 14. Reagent according to ~~claims 1-13~~ ^{claim 1}, wherein the effector agent comprises aryl halides and vinyl halides for radionuclides of halogens, amino-carboxy derivatives, preferably EDTA and DTPA derivatives, including Me-DTPA, CITC-DTPA, and cyclohexyl-DTPA, and cyclic amines, pre-

ferably NOTA, DOTA, and TETA for In, Y, Pb, Bi, Cu, Sm, and Lu radionuclides.

a
15. Reagent according to ~~claims 1-14~~ ^{claim 1}, wherein the effector agent is provided with positron imaging radionuclides, preferably F-18, Br-75, Br-76, and I-124; therapeutic radionuclides, preferably Y-90, I-131, In-114m, Re-186, Re-188, Cu-67, Sm-157, Lu-177, Bi-212, Bi-213, At-211, Ra-223; and gamma imaging radionuclides, preferably Tc-99m, In-111 and I-123.

a
16. Reagent according to ~~claims 1-11~~ ^{claim 1}, wherein the effector agent is a photoactive compound or a compound which can be converted to a photoactive compound, preferably a chromophore or fluorophore or alike compound.

a
17. Reagent according to ~~claims 1-16~~ ^{claim 1}, wherein linker 2 is excluded.

a
18. Reagent according to ~~claims 1-16~~ ^{claim 1}, wherein linker 2 provides a spacer length of 1-25 atoms, preferably a length of 6-18 atoms, or groups of atoms.

a
19. Reagent according to ~~claims 1-16~~ ^{claim 1} and 18, wherein in linker 2 contains hydrogen bonding atoms, preferably ethers or thioethers, or ionizable groups, preferably carboxylates, sulfonates, or ammonium groups, to aid in water solubilization.

a
20. Reagent according to ~~claims 1-19~~ ^{claim 1}, wherein the biomolecule reactive moiety is chosen from the group consisting of active esters, preferably N-hydroxy-succinimide esters, sulfo-N-hydroxysuccinimide esters, phenolic esters, aryl and alkyl imitates, alkyl or aryl isocyanates or isothiocyanates reacting with amino groups on the biomolecule, or maleimides or alpha-haloamides reacting with sulfhydryl groups on the biomolecule, or aryl or alkylhydrazines or alkyl or aryl hydroxylamines

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reacting with aldehyde or ketone groups naturally occurring or synthetically produced on the biomolecule.

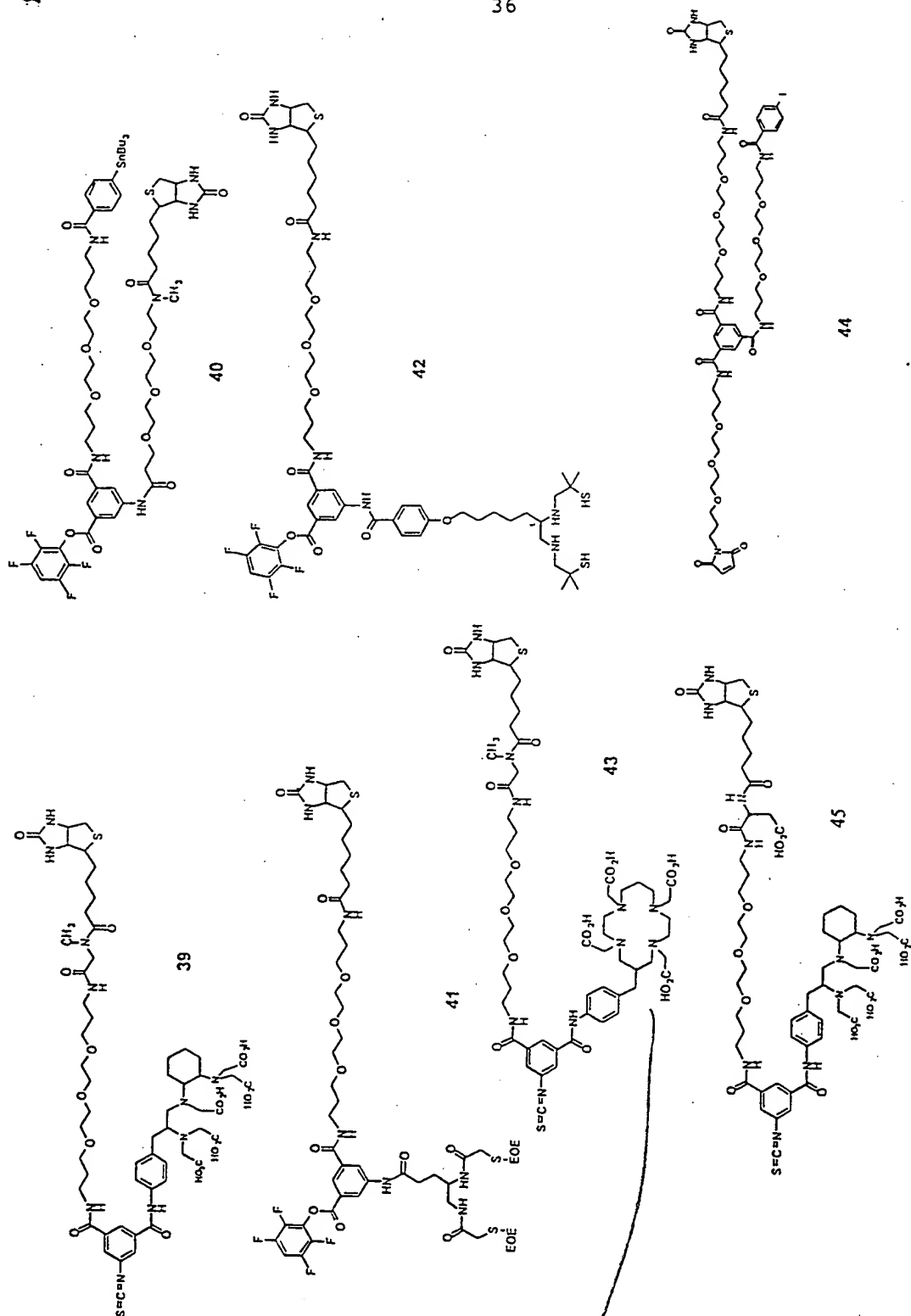
21. Reagent according to ~~claims 1-20~~ ^{claim 1}, wherein linker 3 is excluded.

5 22. Reagent according to ~~claims 1-20~~ ^{claim 1}, wherein linker 3 provides a spacer of a length of 1-25 atoms, preferably a length of 6-18 atoms, or groups of atoms.

23. Reagent according to ~~claims 1-20 and 22~~ ^{claim 1}, wherein linker 3 contains hydrogen bonding atoms such as ethers
10 or thioethers, or ionizable groups, preferably as carboxylates, sulfonates, or ammonium groups to aid in water solubilization.

24. Reagent according to ~~any of the previous claims~~ ^{claim 1}, wherein it is chosen from the group consisting of the
15 following compounds:

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5 26. Reagent according to ~~any of the previous claims~~
for diagnosis and treatment of human and animal con-
ditions or diseases, preferably in targeting of cancer,
myocardial infarcts, deep vein thrombosis, stroke loci,
pulmonary embolism and atherosclerosis.

10 27. Reagent according to ~~any of claims 1-25~~ for the
in vitro analysis of affinity labelled biomolecules,
preferably biomolecules labelled with biotin or deriva-
tives thereof, wherein the amount of affinity label bound
to the biomolecule is determined.

15 28. Method for diagnosis or treatment of a mammalian
condition or disease, wherein a reagent according to any
claim ~~of the previous claims~~ is conjugated to a biomolecule,
and wherein said conjugated biomolecule is added to the
blood circulation of a mammal and kept therein for a cer-
20 tain time in order to be concentrated to the target tis-
sue or cells on which it is to be detected and/or exert
its therapeutic action, wherein the conjugated
biomolecules not being attached to the target tissue is
completely or partially removed from blood circulation by
25 the administration of a protein specifically binding to
the affinity ligand or by passing the mammalian blood or
plasma through an affinity column specifically adsorbing
the conjugated biomolecule by specific interaction with
the affinity ligand.

30 29. Method for diagnosis or treatment of a mammalian condition or disease, wherein a reagent according to ~~any~~ claim 1-26 provided with a radionuclide is conjugated to a biomolecule, or alternatively, the reagent is

[illegible]

a

30. Kit for extracorporeally eliminating or at least
15 reducing the concentration of a non-tissue-bound thera-
peutic or diagnostic biomolecule conjugate, which has
been introduced to a mammalian host and kept therein for
a certain time in order to be concentrated to the spe-
cific tissues or cells by being attached thereto, in the
20 plasma or whole blood of the vertebrate host, said kit
comprising a therapeutic or diagnostic biomolecule, a
reagent according to ~~any of claims 1-26~~ *claim 1* for simultaneous
conjugation of an affinity ligand and an effector agent
to a biomolecule, means for extracorporeal circulation of
25 whole blood or plasma from the vertebrate host, an
optional plasma separation device for separation of
plasma from blood, an extracorporeal adsorption device,
and a means for return of whole blood or plasma without
or with low concentration of non-tissue-bound target
30 specific therapeutic or diagnostic agent to the mammalian
host, wherein the adsorption device comprises immobilized
receptors specific towards an affinity ligand.

31. A kit according to claim 30, wherein the effector agent is chosen from the group consisting of synthetic or naturally occurring toxins, enzymes capable of converting a pro-drug to an active drug,

5 immunosuppressive agents, immunostimulating agents, and radionuclide binding ~~bonding~~ moieties with or without the radionuclide.

a 32. A kit according to ~~claims 30 and 31~~ ^{claim 1}, wherein the affinity ligand is biotin, or a biotin derivative having
10 essentially the same binding function to avidin or streptavidin as biotin, and the immobilized receptor is avidin or streptavidin, or any other derivatives, mutants or fragments of streptavidin having essentially the same binding function to biotin.

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